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Rationing Agricultural Credit in LDCs: The Role and Determinants of Transaction Costs for Borrowers

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Abstract

Agricultural credit programs in lesser developed countries (LDCs) frequently incorporate low interest rates to benefit small farmers. This paper investigates the role of transaction costs (in addition to interest rate charges) as a logical rationing mechanism in agricultural credit markets in LDCs that in effect creates unanticipated and undesired results among borrowers. Recent research in five LDCs suggest that the intended effect of credit policies to promote uniformly low interest rates to all borrowers is not attained in practice. Instead a skewed, regressive incidence of total costs (interest rates plus transaction costs) on borrowers emerges. A more detailed study in one of these countries indicates that transaction costs as a percent of loan amount decrease with loan size, decline with increases in the interest rate (reflecting a "trade-off" relationship), are more significant for small than for large loans, and are higher for private than for development bank loans at given loan sizes and interest rates. This trade-off (i.e. the negative elasticity between the interest rate and transaction costs) is larger for private banks than for the development bank, suggesting that private banks are more responsive and flexible in adjusting their loan procedures to a changing regulatory environment. Finally, contrary to conventional wisdom, an increase in the explicit interest rate on loans would have a progressive impact, since it would reduce transaction costs more for small than for large loans.

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1. Introduction

Transaction costs in financial intermediation are a measure of the "friction" existing in the functioning of financial markets. The higher the costs of intermediation, the less efficient the performance of the financial sector in resource allocation and distribution. Transaction costs frequently increase as a result of regulations imposed on financial markets, such as interest-rate restrictions and selective credit policies. Financial intermediaries circumvent interest-rate regulations through non-price mechanisms that generate transaction costs for lenders and borrowers, whereas selective credit policies usually carry built-in cost-increasing procedures and requirements.

In this paper we investigate the role of transaction costs of borrowing as a rationing mechanism in the agricultural credit markets of five less-developed countries. We show that borrowing transaction costs become an effective non-price rationing device in these markets. We further argue that the results of these rationing practices are regressive, despite the intended distributional goals of low-interest rate credit policies and small-farmer credit allocations schemes. We also investigate the main determinants of borrowing transaction costs, and show that an inverse relationship exists between the level of the explicit interest rate charged on loans and the magnitude of these transaction costs. Our findings indicate that both development banks and private banks pass on transaction costs to borrowers as an implicit-pricing mechanism to ration out undesired clients. Private banks are generally more effective in doing this than development banks, and at the same time, more responsive to changes in the interest-rate structure.

We first present a summary and discussion of recent evidence on the levels and degree of regressiveness of borrowing transaction costs in agricultural credit. The next section deals with the main determinants of these costs borne by farmer borrowers, emphasizing the trade-off between transaction costs and interest rates on the one hand, and the differences between private bank and development bank behavior on the other hand. Major conclusions follow.

2. Borrowing Transactions Costs in LDCs: A Review of Recent Research

This section draws upon results from field surveys reported in five different studies of agricultural credit programs undertaken between 1981 and 1983. Four of these studies correspond to Latin-American countries: Honduras (Cuevas), Ecuador, Panama and Peru (Inter-American Development Bank), while the fifth study was undertaken in Bangladesh (Ahmed). These surveys document the explicit and implicit non-interest costs incurred by farmer-borrowers in the process of securing and repaying loans. Explicit costs consist primarily of transportation, lodging, and meal expenses associated with trips to the bank's office, and fees and other cash payments for documents and legal procedures. Implicit costs correspond to the opportunity cost of time spent by farmers in negotiating and securing their loans.

The most important common characteristic of all five case studies is a low nominal interest rate to provide subsidized credit to small and medium-sized farms. These rates implied negative real interest rates in

three cases: -3 percent in Bangladesh, -0.5 percent in Ecuador, and -22 percent in Peru. In the other two cases the resulting real interest rates were positive (i.e. 3.3 percent in Honduras, and 2 percent in Panama) though still clearly subsidized when taking into account the opportunity cost of capital in these societies.

Table 1 summarizes the results reported in the five country-studies. Panel A presents the magnitude of transaction costs as a percent of the loan amount. In panel B, these transaction costs have been expressed as a proportion of the explicit-interest charges documented in the case studies. This proportion indicates the relative importance of transaction costs vis à vis explicit interest charges. In both panels we report the sample average of each measure, and the results for three loan-size categories.

Transaction costs as a percent of the loan amount vary between 1.2% (Peru) and 21.7% (Bangladesh), and the magnitudes across countries and loan-size categories range from 0.2% to almost 30%. There is a striking contrast between the results shown for Bangladesh and those reported for the Latin-American countries. This contrast is accounted for by the unusually small loan sizes characteristic of the Bangladesh survey in comparison to those recorded in Latin America. This contrast is also reflected in panel B, where transaction costs are expressed as a percent of explicit-interest charges. Here transaction costs for Bangladesh are on average almost twice as large as the explicit interest charged on loans, whereas in the Latin-American cases they represent between 4% and 46% of explicit interest. With the exception of Peru, the findings suggest that borrowing transaction costs play an important role as implicit prices in these credit markets. Their magnitude certainly cannot be ignored by prospective borrowers. Loan procedures established by lenders create these transaction costs and should be interpreted as rationing or screening devices. These mechanisms substitute for explicit prices (i.e., interest rates) that are constrained under the regulatory schemes prevailing in these markets.

The figures in table 1 also highlight the distributional effects of credit rationing through this implicit pricing. In all cases the incidence of transaction costs by loan-size categories is clearly regressive with small loans bearing high costs and large loans entailing the lowest borrowing transaction costs as a percent of the loan. In relative terms, transaction costs for small loans in Honduras are almost thirty times as high as those associated with large loans, 8.8 times as high in Ecuador, 4.2 times in Bangladesh, 3.9 times in Peru, and 2.9 times in Panama.

We conclude that the intended effect of credit policies promoting a low and relatively uniform interest rate among borrowers is not attained in practice. Instead, a skewed, regressive structure of total credit costs (interest rate plus transaction costs) is obtained. Even when the administered rates are set so that small loans are charged a lower rate than medium or large loans, as is the case in the Ecuador study, transaction costs more than offset the explicit interest-rate differential (two percentage points in the Ecuador case).

3. Some Determinants of Borrowing Transaction Costs: Interest Rates and Lending Institutions

The Honduras case provided information on transaction costs borne by clients of the development bank, private banks, and credit unions. Lenders were constrained by a narrow range of explicit interest rates they

Table 1. Borrowing Transaction Costs at the Farm Level in Selected Countries, by Loan Size.

Transaction Costs By Loan Size	Bangladesh	Ecuador	Honduras	Panama	Peru
A. Transaction Costs as Percent of Loan Amount					
Sample Average	21.7%	2.8%	3.0%	5.2%	1.2%
Small Loans	29.4	5.3	5.9	5.7	3.9
Medium Loans	17.5	2.0	1.6	3.0	1.3
Large Loans	7.0	0.6	0.2	2.0	1.0
B. Transaction Costs as Percent of Explicit-Interest Charges[a/]					
Sample Average	180.8%	22.9%	23.1%	46.4%	4.0%
Small Loans	245.0	47.7	45.4	50.9	13.0
Medium Loans	145.8	17.3	12.3	26.8	4.3
Large Loans	58.1	4.1	1.5	17.9	3.3

Sources: Bangladesh, Ahmed; Honduras, Cuevas; Ecuador, Panama, and Peru, Inter-American Development Bank.

a/ Computed based on the levels of explicit interest rate reported in the different sources, e.g., for Bangladesh the average transaction costs in panel A is 21.7% and the explicit rate reported by Ahmed is 12%, therefore (21.7/12) * 100 = 180.8%.

could charge on loans, therefore they used selective and discriminatory application of their loan procedures to screen and ration out loan applicants. Transaction costs were passed on to borrowers in direct proportion to the perceived risk involved in the different loan operations.

A trade-off equation was estimated between borrowing transaction costs and the explicit interest rate charged on loans. In this estimation a generalized power function was specified with transaction costs as a function of the explicit interest rate, the area of the farm, the loan amount, a set of dummy variables to account for loan source (development bank, private banks, credit unions), and another set of dummy variables that captured the effect of loan end-use.[1/]

As expected, transaction costs as a percent of the loan amount were a decreasing function of the loan amount. Transaction costs per loan are an increasing function of loan amount, however, the elasticity of this function is less than one, therefore transaction costs per loan increase at a decreasing rate as loan size increases. As a result, transaction costs per unit of money borrowed decrease as the loan amount increases.

The results obtained for the effect of the interest rate on transaction costs were also significant and stable across different specifications. Overall, the coefficient associated with the direct effect of

the interest rate on transaction costs was not significantly different from -1. This finding indicates that there is a trade-off between transaction costs of borrowing and the nominal interest rate charged on loans, such that a one-percent increase in the interest rate will bring about a one percent decrease in borrowing transaction costs.

The foregoing general results for the overall sample are broken down in table 2 controlling for both the loan source and the loan-size. For simplicity, only two loan sources (development bank, private banks) and two loan-size categories are defined here. The first column of table 2 indicates the estimated transaction costs as a percent of the loan amount. It is evident from these figures that borrowing from private banks is about twice as expensive as borrowing from the development bank, a finding that suggests a greater ability of private banks to pass on transaction costs to borrowers. The skewed, regressive incidence of transaction costs by loan size is clear in table 2, regardless of the lending institution involved.

Column two of table 2 reports the elasticity of transaction costs with respect to the interest rate for different combinations of loan source and loan size. Borrowing transaction costs are very elastic to changes in the interest rate in the case of private banks. For these loans the absolute value of the elasticity is three to five times as large as the values obtained for the development bank. In the latter, large loans show a unitary elasticity whereas for small loans the response of transaction costs to changes in the interest rate is inelastic (significantly less than zero and greater than -1). For small-loan operations, the absolute value of the elasticity is lower than the values obtained for large loans, denoting a less flexible response. This is expected, since smaller loans are associated with more rigid and cumbersome targeting schemes.

Table 2. Borrowing Transaction Costs as Percent of Loan Amount (t), Elasticities of t with respect to Changes in the Explicit Interest Rate (i), and Changes in t with Increases in i, by Lender and Loan Size.

Lender/Loan Size	Estimated Value of Transaction Costs (t)a/ %	Estimated Value of Elasticityb/ e(t,i)	Change in t with a one-point increase in the interest rate (i) pct. points
Development Bank			
Small Loans	2.85	-0.5551	-0.123
Large Loans	0.38	-0.8425c/	-0.025
Private Banks			
Small Loans	5.77	-2.6692	-1.184
Large Loans	0.77	-2.9566	-0.175

Source: Cuevas. Detailed results of the estimated function available from the authors. See note 1/.

a/ Estimates evaluated at geometric means of farm area and interest rate.

b/ All estimates significantly different from zero.

c/ Not significantly different from -1.

The response of transaction costs in percentage points to a one-point increase in the interest rate were calculated based on the elasticities discussed above. These are presented in the last column of table 2. This response is considerably larger for private-bank loans. A one-point increase in the explicit interest rate will lead to a larger compensatory decline in borrowing transaction costs in private-bank loans than in the case of loans from the development bank. This result shows that private banks are more responsive and flexible in adjusting their loan procedures and requirements to changes in the regulatory environment.

In both lending institutions the compensatory change in borrowing transaction costs as a result of an increase in the interest rate is considerably larger for small loans than for large loans. This implies that a one-point increase in the interest rate will be almost fully translated into a corresponding increase in total borrowing costs (i.e., interest rate plus transaction costs) in the case of large loans, since the compensating effect of reduced transaction costs is very small. For small loans however, this offsetting response of transaction costs is far more important. Thus an increase in the explicit interest rate will be partially compensated by the resulting reduction in borrowing transaction costs. Since this offsetting effect occurs for increases as well as decreases in the level of the interest rate, it follows that further reductions in the interest rate on loans will benefit primarily borrowers of large amounts, instead of farmers borrowing small loans. In this sense, cheap-credit policies will not attain their intended distributional goals in the rural sector.

4. Summary and Conclusions

In this paper we have investigated the role of transaction costs of borrowing as a rationing mechanism in agricultural credit markets in less developed countries. Results of recent research in five LDCs suggest that the intended effect of credit policies involving a low and relatively uniform interest rate is not attained. Instead, a skewed, regressive structure of total credit costs (interest rate plus transaction costs) is obtained.

The estimation of a transaction-costs function based on data from one of the case studies above indicated that loan amount, interest rate, and loan source are significant determinants of the level of transaction costs. Transaction costs as a percent of the loan amount decrease with loan size, decline with increases in the interest rate (i.e., the trade-off relationship), and are higher for private-bank loans than development-bank loans, at given loan sizes and interest rate. The trade-off (negative elasticity) is larger in private banks than in the development bank, and is more significant for small loans than for large loans. We conclude that, under interest rate restrictions, private banks are more effective in passing on intermediation costs to borrowers than development banks. At the same time, private banks are more responsive to changes in the interest-rate structure, and more flexible in adjusting their loan procedures and requirements to a changing regulatory environment. Finally, contrary to conventional wisdom, an increase in the explicit interest rate on loans would have a progressive impact, since it would reduce transaction costs more for small loans than for large loans.

Notes

1/ The transaction-costs function estimated here is:

$$\ln T = a_0 + a_1 \ln A + a_2 \ln L + a_{30} \ln(i) + a_{31} S \ln(i) + a_{32} D_1 \ln(i) + a_{33} D_2 \ln(i) + a_{34} F \ln(i) + b_1 D_1 + b_2 D_2 + c_1 U_1 + c_2 U_2 + c_3 U_3$$

where,

T is the borrowing (non-interest) transaction costs per loan,
A is the area of the farm,
L is the loan amount,
i is the explicit interest rate that can be charged on the loan by the lender,
S is the dummy variable for loan-size category,
S=1 if the loan amount is less than or equal to L. 2,000,
S=0 otherwise,
D_1 and D_2 are dummy variables that account for deviations of T in private banks and credit unions with respect to the development bank, that is used as the base or level of reference,
F is a dummy variable for farm-size category,
F=1 if the area of the farm is less than or equal to 20 hectares
F=0 otherwise,
U_1, U_2, and U_3 are dummy variables defined to capture the effects on transaction costs of different loan-uses: basic grains, export crops, and livestock, as deviations with respect to a miscellaneous end-use category conformed by all other end-uses in agriculture (land purchases, trade, vegetable crops, and others).

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